AUGUST/1962

agricultural marketing

A New Method for Vacuum-Cooling Lettuce

U.S. DEPARTMENT OF AGRICULTURE

agricultural marketing

Volume 7, Number 8

ORVILLE L. FREEMAN
Secretary of Agriculture

S. R. SMITH, Administrator
Agricultural Marketing Service

Contents

August 1962

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Cover page

Vacuum-cooling carton-packed lettuce in Somerton, Arizona, to remove field heat. At the present it takes about 20 to 25 minutes to cool a tank-load of lettuce. As a result of a research study made by USDA's Agricultural Marketing Service (*see page 4*), there is now available to the industry a new method that brings the temperature down to 34° F. in about 15 minutes. The saving in time is particularly advantageous during the height of the harvest season when large quantities of lettuce move into packing plants. There is a tendency during this period to sacrifice some cooling in the interest of moving more volume through the chambers.
Speeding the cooling process results in more thorough cooling, with resultant improved market quality and reduced wastage.

Editor, MILTON HOFFMAN

Assistant editor, DANIEL W. HICKY

AGRICULTURAL MARKETING is published monthly by the Agricultural Marketing Service, United States Department of Agriculture, Washington 25, D. C. The printing of this publication has been approved by the Bureau of the Budget, March 18, 1959. Yearly subscription rate is $1.50, domestic; $2.25, foreign. Single copies are 15 cents each. Subscription orders should be sent to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Photo at left, an overall conception of modern facilities for the New York market are given in this scale model. At the left is the new fresh fruit and vegetable market now under construction. The two rows of buildings in the center will accommodate 200 meat-poultry units; the buildings at the right provide space for an additional 200 butter-margarine-eggs-cheese units. At right, market facilities today.

New Wholesale Food Markets for New York City

STREETS built for horse-and-wagon traffic and Victorian-era buildings have long had a stranglehold on metropolitan New York's wholesale food marketing facilities, in an area world-famous as one of the most modern places to live, work, and play. But members of the area's food industry will soon be able to break free of this stranglehold, in new facilities built to plans developed by the USDA's Agricultural Marketing Service.

No longer will food move at a snail's pace through narrow, crowded streets, and up small, slow elevators to lofts never intended for food handling. Dramatic comparisons will no longer be made between a New York-Chicago plane flight and a four-block trip through New York's teeming streets—which sometimes takes as long as, or longer, than, the 700-mile plane trip.

Gone, too, will be needless food handling, spoilage, deterioration and pilferage—conditions that increase marketing costs, and so result in higher retail prices for New Yorkers. Loss of food, because of such causes, amounts to nearly $7 million a year in five products alone: meat, butter, margarine, eggs, and cheese.

Ground was recently broken for the first new facility in the area to be built—a fresh fruit and vegetable market, in the Hunts Point area of New York City. This new market, together with separate new facilities for meat-poultry and for butter-margarine-eggs-cheese—all developed by AMS marketing specialists—should save $25 million a year, or over $2 for every person in the New York metropolitan area.

On a per-ton basis, the cost of handling meat would be reduced about $15, poultry about $7, and butter-margarine-eggs-cheese about $8 a ton. This is a savings of about a third in physical handling costs in the meat-poultry facility, and about half in the butter-margarine-eggs-cheese facility.

With the streamlined handling practices at the new markets, food will reach consumers in better condition than is now possible. And employees of the wholesale markets will have less difficult work and a better environment, including modern restaurants and spacious parking lots.

In addition, the new markets for meat-poultry and for butter-margarine-eggs-cheese will each be able to house about 200 wholesalers. The meat-poultry market will also have provisions for two additional buildings for larger wholesalers. A parking area for 1,200 cars and trucks is included in the plans for the meat-poultry market and for 1,100 vehicles in the butter-margarine-eggs-cheese market.

Railroad spurs—almost totally lacking in the present facilities— would run alongside each building in each of the new market facilities. The tracks would accommodate about 300 railcars.

Traffic jams would be a thing of the past, as the new facilities would have 200-foot-wide roads and driveways at each facility. Although these provisions all take a lot of space, AMS marketing specialists have provided in the plans for ample room for future expansion.

No site has yet been selected for either the meat-poultry or the butter-margarine-eggs-cheese markets, but there is sufficient space at either Hunts Point or Jersey Meadows to serve the purpose quite well.

Complete specifications and details for the meat-poultry facility are contained in Marketing Research Report No. 556. A marketing research report on plans for the butter-margarine-eggs-cheese facility will be issued later this year. Improved facilities for fresh fruits and vegetables are described in Marketing Bulletin No. 6. Free copies of these publications may be ordered from the Office of Information, USDA, Washington 25, D. C.

RAPID VACUUM-COOLING OF LETTUCE

THE more quickly the field heat is removed from lettuce, the less waste and spoilage happens in marketing channels. And now, thanks to a marketing research project by USDA's Agricultural Marketing Service, operators of vacuum-coolers have a practical way to remove field heat from lettuce faster than ever.

Currently, most lettuce is cooled in 20 to 25 minutes during which time the pressure in the tank is gradually reduced to a final reading of 4.6 millimeters of mercury (4.6 mm. Hg.).

Now, though, lettuce can be cooled in 15 minutes by bringing the vacuum down to 3.8 mm. Hg.

In addition to doing a better job of cooling, this reduction in time permits more lettuce to be moved through the vacuum-cooler in a day's time—no small advantage during the peak of the harvest season.

However, marketing researchers say that certain conditions of pressure and cooling time must be met for a good cooling job. For example:

- A more sensitive pressure gauge must be used. The cost would be less than $200.
- Operators of the plants should not rely on wet-bulb thermometers when the pressure is less than 4.6 mm. Hg. At low pressures, the wet-bulb thermometer tends to freeze and response is slow.
- The vacuum should be brought down to the "flash" point (where the vacuum causes a quick release of moisture) as fast as possible, because no cooling takes place before this point.
- To reach an average temperature of 34 degrees F. (an ideal temperature), the vacuum should be held 15 minutes after reaching the "flash point" and during this time brought down to a final 3.8 mm. Hg. This is for a load of lettuce that has an average temperature of 60 degrees F. before vacuum-cooling.

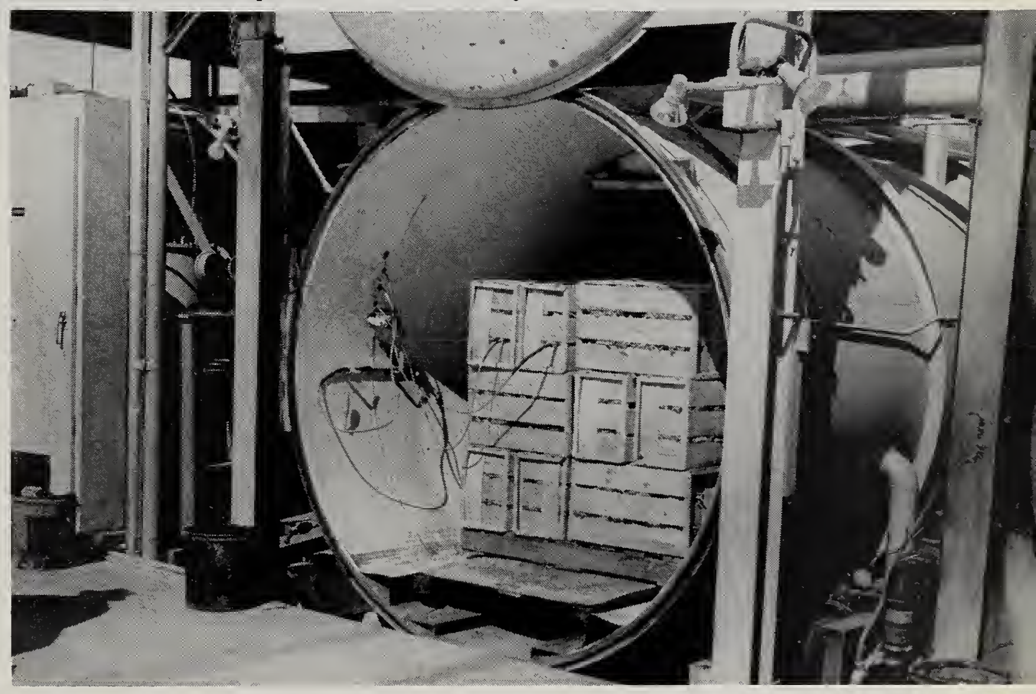
In mechanical plants where condensers are used, operators are urged not to use the gauge on the ammonia line to judge the temperature at the surface of the pipes. Tests show that often the temperature on the condenser cooling surface is above freezing even though the ammonia temperature gauge (located elsewhere) gives a below-freezing reading.

As a further refinement, a distant-reading thermometer can be installed on the condenser pipe. This gives the operator the information he needs to turn the refrigeration on and off, as needed, for cooling the lettuce in the shortest possible time.

AMS marketing researchers checked 20 test runs in a mechanical plant, 6 runs in a unit cooler, and 6 runs in a steam plant. In all of the plants it was possible to do a good job of vacuum-cooling, using the new method without freezing the lettuce.

For more details, write the Marketing Information Division, Agricultural Marketing Service, United States Department of Agriculture, Washington 25, D. C. Ask for a free copy of AMS-469, "Rapid Vacuum-Cooling of Lettuce."

A packing van moving through a lettuce field. On the van, the lettuce is wrapped with shrink film, boxed, and dropped off for another truck to pick it up and take the cartons to the sheds. At right, USDA inspector checks lettuce before it is cooled.



Lettuce is moved into vacuum-cooler and temperature-recording devices are attached to cartons. After the lettuce has been cooled, it is then moved along conveyor lines to refrigerated rail cars and trucks for movement to all parts of the U.S.

Japan was our biggest customer in 1961, displacing the United Kingdom as the largest outlet for U.S. farm products. The Japanese bought $554 million worth of commodities.

U. S. Exports $5 Billion Worth of Farm Products

By ROBERT L. TONTZ

MORE exports and less imports—that was the overall view of foreign agricultural trade in 1961. A record of over $5 billion worth of U.S. farm products was shipped to customers overseas last year. In turn, we rang up a bill of $3.7 billion for agricultural imports—the smallest in 12 years.

As a result, 1961 agricultural exports exceeded imports by $1.3 billion compared to $1 billion in 1960.

Counting only commodities that compete with U.S. farm production, exports were $3.1 billion more than imports for '61 and $2.9 billion more in '60.

Several factors contributed to a year of brisk trade. Many of our world customers held record accounts of U.S. gold and dollars.

Business was active in France, Italy, Japan, and Canada, which made it possible for them—some of our largest buyers—to purchase even more of our farm goods. However, economic expansion in the United Kingdom and West Germany slowed. Germans revalued the mark, which stimulated U.S. exports to them somewhat, but restrictions on the outflow of British pounds discouraged trade in that country.

On the supply side, plenty of American agricultural commodities were available for export. The export-payment program helped us meet foreign competition, especially in cotton, wheat, rice, and feed grains.

When the value of all the agricultural exports in 1961 was added up, it was equivalent to 14 percent of all cash received by farmers for their products last year. More than two-thirds of total exports were sold for cash. The rest was exported under Government-financed programs.

As an indication of their importance to American farmers, exports provided an outlet for about half of the domestic production of wheat, rice, and dried peas last year. Two-fifths of the cotton and tallow produced were sold outside the U.S. Nearly a third of our tobacco, soybeans, hops, nonfat dry milk, raisins, and hides and skins went abroad.

The export figures for 1961 revealed some shifts in the amounts of individual products sold. Unprecedented shipments of wheat and flour dominated the export scene during '61. Also in the export upswing were poultry meat, variety meats, dairy products, hides and skins, rye, tobacco, and fresh fruits.

Cotton exports dropped off by over 1.1 million bales and the dollar value of shipments of rice, soybeans, cottonseed, soybean oils, lard, and vegetables dropped somewhat, too.

JAPAN was our biggest customer for farm products last year, displacing the United Kingdom as the largest outlet for U.S. goods. The Japanese bought $544 million worth of commodities—$69 million more than in the previous year—including more cotton, grain sorghums, soybeans, hides and skins, and tobacco.

Canada, the leading buyer of U.S. fruits and vegetables, purchased $491 million worth of farm products—$59 million more than in 1961. Sales to the United Kingdom, at $431 million, dropped $79 million from the '60 level. The British bought less of our feed grains, cotton, tobacco, and wheat.

Meanwhile, we bought $134 million less of foreign agricultural products than the $3.8 billion total for 1960. Farm commodities accounted for 26 percent of all imports during the year.

Last year's decline in agricultural imports was in noncompetitive items while trade in partly competitive products was slightly larger.

Increases in partly competitive commodities were in cattle, beef and veal, apparel wool, barley, and cheese. Imports of cane sugar, copra, molasses, tomatoes, and hides and skins dropped off.

Coffee was by far the largest noncompetitive import—Americans bought 2,970 million pounds and paid $964 million for it last year. However, both coffee and crude rubber imports were down in value for '61. Also down slightly were tea, carpet wool, bananas, and spices. Cocoa beans were the only noncompetitive import to show an increase.

For calendar 1962, the outlook is for exports to continue around the $5 billion level. Imports may be up somewhat from the low point of '61. Most of the import increase is predicted for partly competitive products with a slight upturn in shipments of noncompetitive commodities.

(*The author is Chief, Trade Statistics and Analysis Branch, Development and Trade Analysis Division, Economic Research Service, USDA.*)

HEDGING TRIMS WOOL PRODUCT COSTS

By L. D. HOWELL

TRADING in wool futures is one way wool merchants and manufacturers reduce their risks of financial loss due to frequent changes in wool prices. When risks are reduced, the cost of making and merchandising wool products also goes down.

How wool merchants and manufacturers "hedge" their risks by trading in the futures market is shown in a recent study by USDA's Economic Research Service.

Farmers usually sell most of their wool during or soon after the shearing season. Manufacturers, however, need a year-round supply of wool. Wool merchants provide this supply, getting raw wool in country or import markets and holding it until needed by manufacturers.

This practice entails considerable risk both for merchants and manufacturers. The National Wool Act of 1954 removed price supports on wool.

Since the Act went into effect in 1955, wool prices have fluctuated freely from year to year and even from month to month. If the price drops only a few cents a pound between the time a merchant buys a large quantity of wool and the time he sells it to a mill, his loss can run into thousands of dollars. On the other hand, if the price goes up the merchant gains, but the manufacturer pays thousands more than if he had bought earlier.

Price changes over 16-week periods have been known to result in gains or losses greater than the total marketing margin for buying, handling, storing, and shipping wool all the way from farm to mill.

Few merchants or manufacturers have adequate capital resources to assume the risk of frequent price changes. Consequently, they use futures contracts as hedges to offset losses from price changes.

Hedging is based on the assumption that the prices of wool and of wool futures tend to rise and fall together. Often they don't, and even when both rise or fall they almost never change by the same amounts. Somewhat oversimplified, hedging works this way:

If, for example, in May a merchant buys 50,000 pounds of raw wool at $1.02 a pound, he has invested $51,000. At the time, wool is selling to manufacturers at $1.10 a pound. If the merchant sells immediately, he has 8 cents a pound, or $4,000 margin to cover handling costs and a profit. If he can't sell immediately, he can hedge his risk of a loss from price declines by selling a futures contract for the same amount, that is, 50,000 pounds. Assume the futures price is also $1.10.

In October the merchant finds a buyer, but prices of wool and of wool futures have dropped 5 cents a pound. Thus, on the sale of the wool, he loses $2,500. But since futures prices have also declined, he can now buy back his futures contract at $1.05 a pound, gaining $2,500. In this way he offsets the loss on the wool sale by the gain on the futures contract. The 8-cent marketing margin from which he makes his profit is still intact.

Manufacturers hedge to protect themselves against a rise in prices of wool, when they have sold their wool products forward at a fixed price, before they buy the raw wool to make the products.

By hedging, both merchants and manufacturers improve the collateral value of wool for bank loans. This, in turn, may reduce their financing costs.

Futures trading also seems to hold down the extent of price swings in wool and wool products from year to year and from one part of the season to another. On the other hand, it appears to increase the frequency of price changes over shorter periods and at times actually may augment them.

(*The author is a staff member of the Marketing Economics Division, Economic Research Service, USDA.*)

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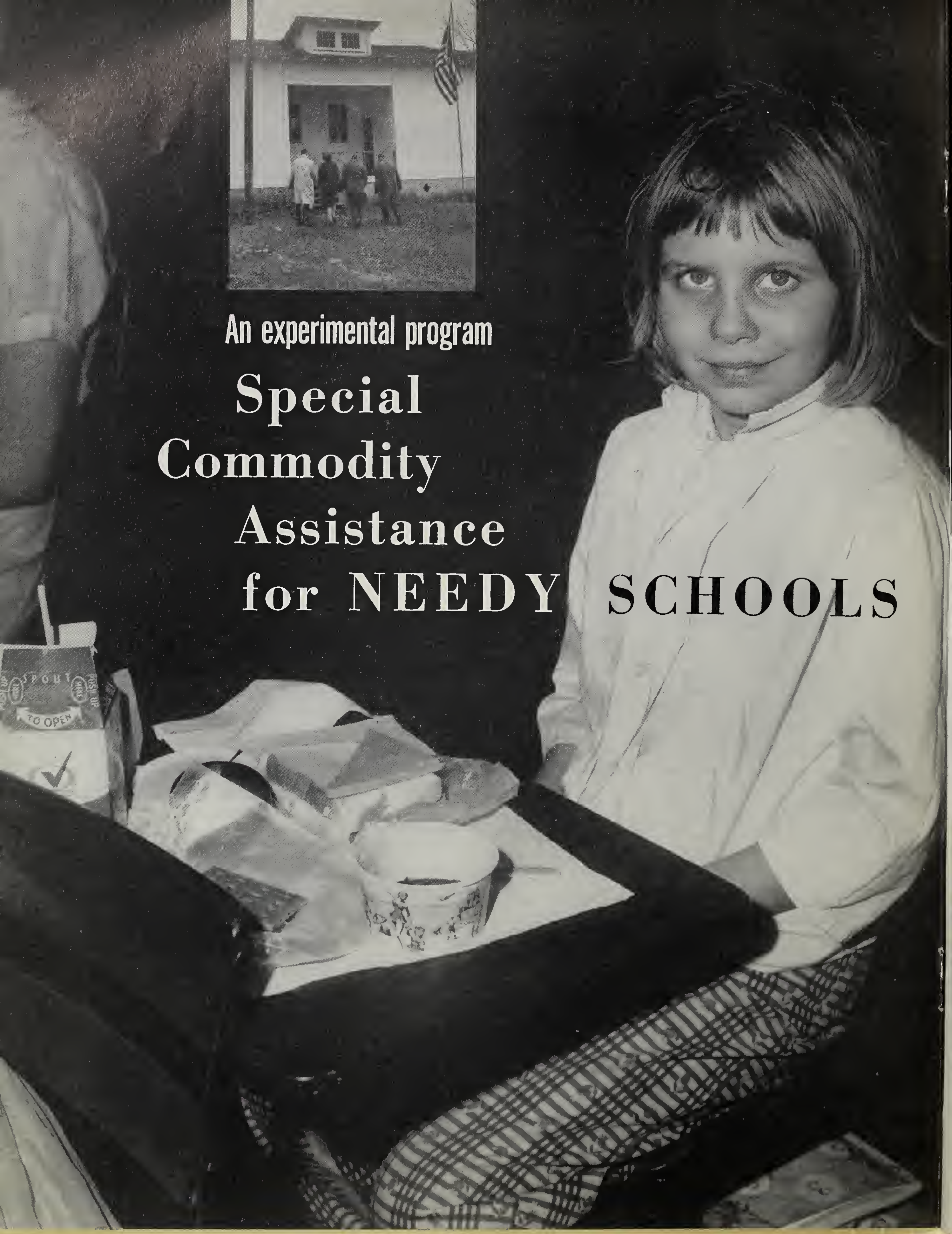
When risks are reduced, the cost of making and merchandising wool products goes down.



An experimental program

Special Commodity Assistance for NEEDY SCHOOLS

A wood and coal burning home-type range is used in an Alabama school to prepare lunches under Special Commodity Assistance Program.

Hand-stoked coal stoves are commonplace in West Virginia's needy schools.

School lunch supervisor pitches in to help head cook prepare sandwiches for first day of the West Virginia packaged lunch plan for needy schools.

IN especially needy schools USDA has instituted an experimental Special Commodity Assistance Program for school lunches.

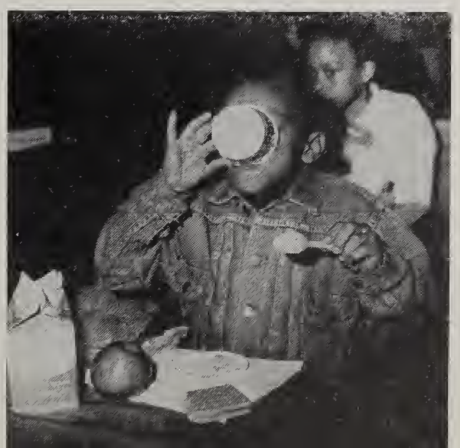
Because of inadequate facilities—some of them still use the old-style pot-belly stove for heating—and insufficient funds, many schools have been unable to take advantage of the regular school lunch program or run one of their own.

The new lunch operation in West Virginia, for example, provides for bag lunches to be made at a central point and shipped to the schools in time for lunch. A variation of this system provides food to schools without cafeterias or kitchens. Hot lunches are prepared in facilities adapted to mass feeding use.

Through this process, children—some of whom have never been exposed to a nutritionally balanced meal at school—are assured a Type-A lunch that gives them a third of their minimum daily nutritional requirements.

This special assistance program is now operating in almost 270 schools in 22 states, feeding close to 25,000 children. Children are able to get a well balanced lunch at a cost geared to their ability to pay. The children need it . . . and they like it.

These two children enjoy their meal of beef hash, canned tomatoes on rice, two hot biscuits, whole milk, and canned applesauce.



It's good to the last drop. Orange juice was a popular item in the packaged lunch program.

U.S.D.A. marketing researchers recommend improved practices for

Lowering grocery handling costs in retail food stores

By JAMES J. KARITAS

THE price consumers pay for food includes the cost of handling it. Faster, more efficient handling in retail food stores can help hold down the cost of food.

This is one of the reasons why researchers of USDA's Agricultural Marketing Service develop time-saving ways of handling groceries. This type of cost-cutting research, coupled with the miracles of production research, has made it possible for the American consumer to spend in 1961 less than a fifth of his take-home pay for food. During 1947-49, immediately after World War II, his food cost about a fourth of his take-home pay.

An example of potential consumer-savings can be given for an average-size supermarket handling 2,000 cases of dry groceries a week. This amounts to 52,000 individual items.

If just one second were saved in the handling time per item, it would amount to 14 hours per week. And annual savings in handling costs would amount to over $1,400.

Such savings, or even higher savings, have been made with work simplication and other techniques by AMS research engineers. And most of these techniques save a lot more than one second per grocery item.

One AMS study has saved considerable time and money by encouraging greater use of tray packs to handle fast-moving groceries. (Tray packs are made by cutting around a carton a short distance from both top and bottom, forming two trays to hold the cans). Tray-packs eliminate the time-consuming job of handling individual items.

A store with a $20,000 grocery department can tray-pack up to 40 percent of its weekly movement. Tray-packing can save up to $3,000 a year, or 12 percent of handling costs, in a grocery department with a $20,000 weekly business volume. Savings would be less in a smaller store, but still worthwhile.

Further savings can be made by pricing groceries with stick-type pricing stamps instead of the adjustable band-type stamps. Marketing researchers recommend a set of 59 stick stamps, plus a band stamp for single prices, and another one for multiple prices. This combination will save 8.6 seconds per case, or $4.80 per thousand cases.

Such a saving is no trifling sum when applied to the earlier mentioned example of the average-size supermarket handling 2,000 cases of dry groceries a week. This represents 104,000 cases a year, with annual savings of about $500 when the recommended pricemarking stamps are used.

HANDLING costs are also reduced and sales increased when space on the shelves is assigned with a careful eye towards minimizing costly restocking. For instance, a slow-moving item in the canned fruits and vegetables sections may be reduced from three or four rows to two rows without hurting sales. And by increasing a fast mover's space from three or four rows to five or six, sales on that item can be increased by 15 or 20 percent.

Another seemingly small, but potentially important, detail is the use of order forms which provide a built-in record of past movement of stock. Proper use of such records can prevent an oversupply of stock—a condition which develops easily with over 5,000 items in stock. Excessive inventory adds to rehandling—an important hidden cost of handling groceries.

Retailers can help hold down the wholesale cost of groceries by receiving warehouse deliveries promptly when they arrive. Every hour that a driver and delivery equipment are idle is worth about $5. Both retailer and consumer pay indirectly for such delays by increased prices for goods.

Costs at the receiving end can also be minimized by limiting the unloading crew to three men—the driver and two store employees. The driver can unload cases only fast enough to keep two men busy; the addition of more men to the crew does not increase man-hour efficiency.

These examples of seemingly small time and dollar savings add up in the end to many million dollars a year to consumers, larger markets for farmers.

Although wage rates have gone up 85 percent, equipment costs 65 percent, and material costs 67 percent in the last 12 years, unit marketing costs have risen only 38 percent. One of the reasons marketing costs—and retail food prices—haven't gone up more is because of savings such as these developed by marketing researchers.

More detailed examples of possible savings in handling groceries are found in MRR-473, "Handling Groceries from Warehouse to Retail Store Shelves." Single free copies can be obtained from the Office of Information, USDA, Washington 25, D. C.

(*The author is a marketing specialist in the Transportation and Facilities Research Division, Agricultural Marketing Service, USDA.*)

Tray-packs shown above are made by cutting around a carton a short distance from both top and bottom, forming two trays to hold the cans. Tray packs eliminate the time-consuming job of handling individual items.

Marketing researchers recommend a set of 59 stick stamps, plus a band stamp for single prices, and another one for stamping multiple prices.

THE CHANGING FATS and OILS INDUSTRY

By THOMAS B. SMITH

JUST as the map of today's world is a progressive, ever-changing affair, significant changes are also taking place in the patterns of numerous important American agricultural industries.

Among those which have shown notable progress is the fats and oils industry, which can point with pride to numerous beneficial changes during the past 20 years.

Today, the United States is the world's greatest producer of fats and oils. In 1959 alone, our total output of 17 billion pounds represented one-fourth of the world's total supply. And by 1960, the U. S. production had increased to 18 billion pounds. And in 1961, U. S. production, estimated at 18.4 billion pounds, represented more than one-fourth of the estimated world production for that year.

In 1959, our production accounted for 7.8 billion pounds of edible vegetable oils—mainly soybean oil and cottonseed oil—or 30 percent of world output. Production was a little more than 8 billion pounds each year in 1960 and 1961, representing almost a third of world output.

Production of industrial oils—chiefly linseed, castor, tung, and tall—totaled 1.5 billion pounds in 1959 or slightly more than half of world output, and in each year of 1960 and 1961, production was 1.2 billion pounds representing more than a third of the world output.

Production of animal fats—that is, lard, tallow, and grease—ran to 7.5 billion pounds, which totaled slightly more than a quarter of world output in 1959. Production in 1960 was 7.6 billion pounds, and it was 7.8 billion pounds in 1961, representing a little less than a third of the world production.

Output of marine oils was around 0.2 billion pounds each in 1959, 1960, and 1961, or from 9 to 10 percent of world production each year. Marine oils consist of whale, sperm whale, fish oils, and fish-liver oils. They contributed only about one percent of the total domestic supply of fats and oils each year.

FATS are an important and necessary component of our food supply, and food processors have long been the major single outlet for domestic fats and oils. In fact, during the 1939-59 period, from 61 to 67 percent of domestic uses was consumed annually in the manufacture of food products, 65 percent in 1960, and 67 percent in 1961.

In 1960, the distribution, by type, of food use, ran this way: Fourteen percent was butter; 17 percent was used in the form of lard; 28 percent in shortening; 16 percent in margarine; 21 percent in cooking and salad oils; and 41 percent for all other edible uses.

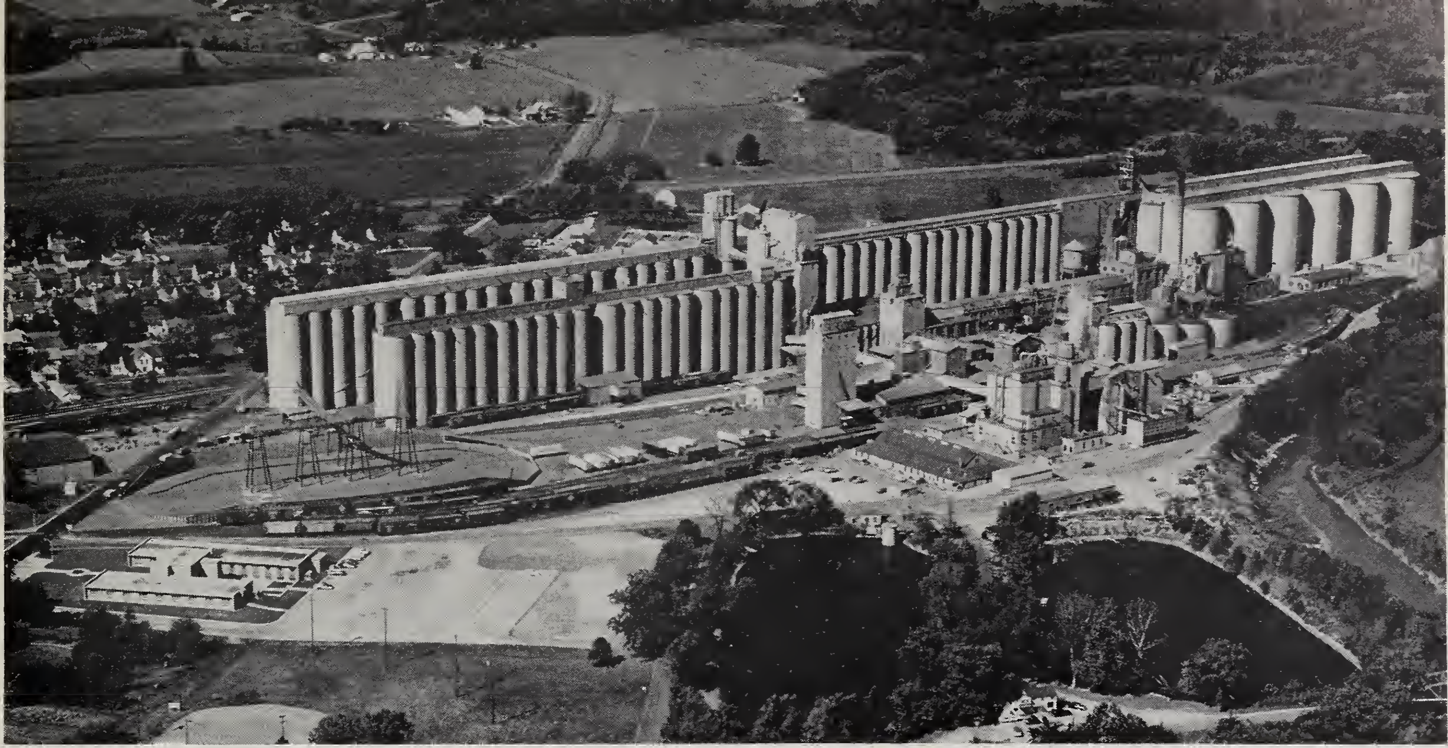
Principal sources of domestic edible vegetable oils are soybeans and cottonseed. Originally, cottonseed was the most important source, but it has been forced to take second place by soybeans, which in the 20-year span ending in 1959, became the leading domestic oilseed crop. In that same period, production of soybeans jumped from 90 million bushels to a staggering total of 533 million bushels in 1959, to 555 million bushels in 1960, and 693 million bushels in 1961.

Important forms of edible, as well as inedible, animal fats include butter, lard, tallow, and grease. Butter, once the leading edible animal fat product, now is second to lard as a result of the competition of margarine, and of the increasing slaughter of hogs and the quantity of animal byproducts for fat production. In 1959 lard contributed 37 percent of domestic output of animal fats; butter, 15 percent; edible tallow, 4 percent; and inedible tallow and greases, 43 percent. In 1960 the percentage distribution was 34, 15, 5, and 46 percent respectively, and in 1961 it was 33, 16, 5, and 46 percent.

AMONG the significant changes which have taken place in the fats and oils industry, here are the most important:

The United States has become self-sufficient in its production of fats and oils, and has changed from a net importer to a net exporter by a wide margin. Exports, which were only 0.6 billion pounds in 1939, increased to 5.4 billion pounds in 1959, 6 billion pounds in 1960, and dropping slightly in 1961 to 5.5 billion pounds. And imports in that same time fell from around 2 billion pounds to 1 billion pounds in 1959, to 0.6 billion pounds in 1960, and 0.7 billion pounds in 1961.

The domestic production of fats and oils has more than doubled—jumping



A modern soybean processing plant in Decatur, Indiana.

from 7.8 billion pounds in 1939 to 17 billion in 1959 to 18.1 billion in 1960 and to 18.4 billion pounds in 1961—yet our per capita consumption has changed little. In 1959 total consumption averaged 70 pounds per person, 69.5 pounds in 1960, and 69.3 pounds in 1961, as against 69.7 pounds some 20 years earlier. But there were notable changes within the food and nonfood groups.

In the food group, for instance, margarine consumption increased, while the use of butter declined. Margarine became the major table spread for the first time in 1957, and has clung to that top spot ever since. Before 1957 butter was the major table spread.

Moreover, uses of shortening increased, while the direct use of lard declined—yet for both cooking fats combined, consumption slipped from 23.4 pounds per person in 1939 to 21.6 pounds in 1959 and to 20.3 pounds in 1960, but jumped back to 21.1 pounds in 1961. The use of lard, though, in the manufacture of shortening has increased.

MEANWHILE, consumption of oils used in other edible products, mainly in cooking and for salad oils, increased from 7.2 pounds per person in 1939 to 10.8 pounds in 1959, to 11.5 pounds in 1960.

As for the nonfood group, a significant change to be noted is the sharp decrease in the use of fats and oils in the production of soap. Consumption fell from 13.9 pounds per person some 20 years ago, to a mere 4.9 pounds in 1959 to 4.8 pounds in 1960, and 4.6 pounds in 1961. This change resulted mainly from the increased use of synthetic detergents instead of soap. The use of synthetic detergents increased from less than half a pound per person in 1939 to 20 pounds in 1958—and, correspondingly, soap uses declined from 25 pounds per person to 7 pounds.

Further, the use of fats and oils in drying oil products declined, and synthetic resins increased. Consumption of fats and oils in all coatings produced decreased from 2 pounds per gallon in 1940 to 1.2 pounds in 1959. And the use of plastics increased from 0.3 pound to 1.3 pounds per gallon of coatings produced.

Consumption of fats and oils in drying oil products dropped from 6.3 pounds per person in 1939 to 5.2 pounds in 1959, to 4.6 pounds in 1960, and to 4.5 pounds in 1961.

There was a sharp increase in the output of inedible tallow and greases and in the quantity exported, but the quantity used in soap declined. During this time volume produced jumped from 1 billion pounds in 1939 to 4 billion pounds in 1961, and correspondingly, the quantity exported increased from 6 million pounds to an amazing 1.8 billion pounds in 1961.

Important technological developments have been made in the fats and oils industry during this period. The development of improved oilseed crushing methods is one of the most significant, and it has resulted in a widespread shift from the hydraulic method of extracting fats and oils from raw materials to the more efficient screw-press, solvent, and pre-solvent methods.

The shift has brought about such changes as a decreased number of oilseed crushers and an increase in the average size of plant, and in the yield of oils.

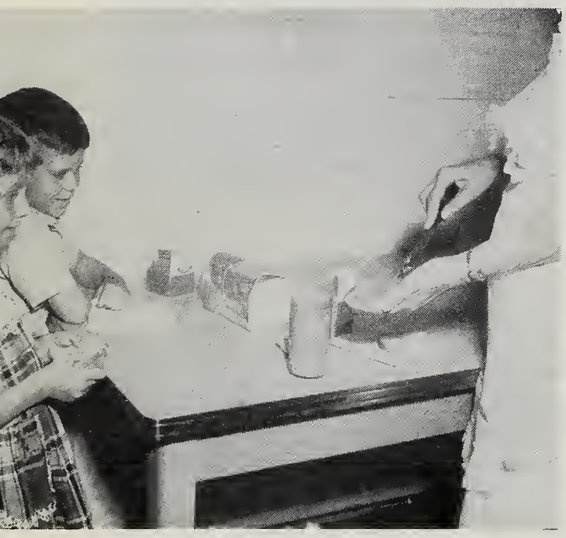
THE hydrogenation of fats and oils is considered a significant technological development in the processing phase of the fats and oils industry. This process, which hardens the oil and removes most of its undesirable flavor and color, has been adopted by the industry primarily during the post-World-War-II years. It has made possible the substitution of less desirable fats and oils for higher cost oils in certain uses.

Demand for fats and oils will continue to increase both domestically and abroad. Long-run prospects indicate that U. S. production will continue upward to meet the expanding markets.

Over the long term, the outlook for U. S. exports of edible oilseeds, and their products, appears bright. Population increases and the uptrend in per capita consumption suggest an expanding market, and foreign output is not likely to show any major sustained expansion. We may, at times, have difficulty in moving large supplies in any one year, but in the long run, U. S. exportable supplies, though large, should be able to move in the export market.

(*The author is a staff member of the Marketing Economics Research Division, Economic Research Service, USDA.*)

THE CHANGING MARKET



WHITE BREAD

THE retail price of white bread has risen more than 55 percent since 1947-49, while the cost of the farm ingredients dropped 12 percent, according to the Economic Research Service of the U.S. Department of Agriculture.

This compares with an 18-percent rise in the Consumer Price Index for all food items purchased for home consumption during the same period. In 1961, white bread sold at an all-time high of 20.9 cents for a one-pound loaf, an increase of 7.4 cents over the 1947-49 level.

All of the increase was due to higher marketing margins at the various levels of production. About 6 cents of the total advance resulted from increased marketing margins for wholesale bakers.

The farm value of the ingredients which go to make up the bread averaged 2.9 cents on a one-pound loaf in 1961, compared with a 3.3-cent value in 1947-49. The drop was due principally to lower farm prices for the wheat, lard, sugar, and milk.

Milling adds another one cent per loaf. From 1947-49 to 1955, the margin for milling remained stable at 0.6 cent per loaf, but since 1955 the margin has risen 67 percent to the present level.

The margin for wholesale baking has nearly doubled since 1947-49. In 1961, the wholesale baker's share of the total price was 11.7 cents per loaf, compared with 6 cents in 1947-49.

Increased labor costs to wholesale bakers, particularly for bread distribution, accounted for a major portion of this sharp rise in the wholesaler's margin.

Total labor cost, including wages, commissions, salaries, and fringe benefits, was 6 cents per loaf in 1961, compared with 2.2 cents per loaf in 1945. Other expenses, including advertising, packaging, delivery, and profits, amounted to 5.7 cents per loaf in 1961, compared with 2.2 cents in 1945.

The retail margin on a loaf of white bread was 3.8 cents in 1961, or 18 per cent of the total price of the bread. In 1947-49, the retail margin was 2.4 cents per loaf.

Prices of bread sold by retail grocery stores under their own labels averaged about 4 cents per loaf lower than prices of other brands in 1961. The lower price was probably due to more streamlined distribution systems and smaller baking and retail margins.

The remaining 1.5 cents the housewife spent on bread in 1961 went for storing, insuring, transporting, and handling. This was only slightly more than these services cost her in 1947-49.

FOOD DISTRIBUTORS

IN the wholesale food-distribution industry, time is an essential factor. Eliminating wasted motion in all phases not only means a more effective operation, but a more profitable one as well. But before the wasted motion can be eliminated, it has to be located—the whole operation must be evaluated.

As part of a continuing effort to achieve increases in the efficiency of marketing agricultural products from the farmer to the consumer, marketing researchers from USDA's Economic Research Service have developed a procedure for evaluating the effectiveness of most delivery operations from grocery warehouses to retail food stores.

Based on time studies, the procedure has proved effective in tests with delivery operations in many sections of the country, and for different kinds and sizes of food wholesalers.

The delivery operation of food wholesalers is, by its very nature, difficult to control. In no phase of the food distribution industry is there more opportunity for idle time than in the delivery operation. The procedure developed by USDA, however, does make it possible to estimate the total delivery time for a given trip, using information that wholesalers usually have about their delivery trips.

Analysis of 15 to 20 trips by a driver will then show whether his performance is at standard, above, or below; analysis of trips by all the drivers permits wholesaler management to evaluate their overall delivery operation against sound standards, and against results obtained in other firms.

The standards developed by the U.S. Department of Agriculture are computed by adding unit time intervals which are listed on special tables. The time units take into account the factors which affect the time it takes to make a delivery trip, including the distance traveled, time to unload and check in the orders, and the time taken at each delivery stop.

Value from this method comes from setting a standard route time that is free from unnecessary time out or delays on the route. Also, standard route time is computed on the basis of current routes and automatically adjusts to route changes. It is not necessary to use past

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- Field Trimming of Lettuce—A Convenience That Saves Money
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performance as a basis for evaluating the delivery operation.

In addition, the use of this new procedure makes it possible to compare the delivery operations between companies, or between divisions of the same firm, or within the same company over different time periods. Finally, the procedure is objective and is based on standard time study techniques and statistical analysis.

While developed for grocery deliveries to retail food stores, the procedure can also be used for most deliveries which include perishables or back hauls.

Copies of the entire research report, "Evaluating Delivery Operations of Wholesale Food Distributors — MRR 502—includes tables and a form that will make it easier to figure out the standard delivery time for individual firms. The report explains the entire procedure in detail and is available on request from the USDA.

TRIMMING LETTUCE

Trimming, packaging, and other convenience services may add to a product's cost, but sometimes they can save money instead. For example, trimming lettuce at the packing plant, or in the field, is not only a service to the retailer and the consumer—it may also save money on shipping charges.

Here's why: Spot checks made by the railroads showed that cartons of untrimmed lettuce weighed up to 58 pounds, although the shipper was being charged for only 43 pounds per carton, under freight schedules in effect at the time of an AMS study. Naturally, the railroads cannot be expected to ship the excess weight free of charge indefinitely.

Here's where field trimming comes into the picture. Cartons of lettuce can be kept down to the 43-pound limit, when wrapper leaves are reduced in the field to 2, instead of the usual 6 to 8, according to research conducted by the USDA's Agricultural Marketing Service. Field trimming may therefore make it unnecessary to increase shipping charges. Although shippers would be the initial beneficiaries, from the cost standpoint, consumers should ultimately benefit, because retail prices fluctuate to reflect marketing costs.

Marketing researchers found that the trimmed heads arrived at the store in just as good condition as untrimmed lettuce. Results of trimming were equally satisfactory with lettuce shipped in both the "hard" and "firm" stages of maturity.

The degree of trimming had little or no effect on external appearance, crushing and bruising, decay, tipburn, russet spotting, rib discoloration, or pink rib.

There were fewer defective leaves in the lettuce trimmed down to two wrapper leaves than lettuce trimmed to six wrapper leaves. The number of leaves removed made no difference in normal shrinkage in transit or from vacuum-cooling.

The marketing researchers made their tests with lettuce shipped from California to New York. The lettuce was held at an average temperature of 39° F., for the 7-day trip, and at 50° for an additional 5 days at the market. Although test results were excellent, less favorable results might be obtained under other conditions. If the lettuce were held for a longer period, for instance, or under adverse conditions, differences in appearance—due to field trimming—might be expected, according to the marketing researchers.

Marketing Research Report No. 497, "Field Trimming of Lettuce," contains more complete details. Single free copies are available from the Office of Information, USDA, Washington 25.

Trimmed head of lettuce with wrapper leaves removed.

THE CHANGING MARKET

PEACH DECAY

PEACH decay sometimes ruins a shipment of perfectly normal peaches before the fruit reaches the consumer. A new way to reduce such decay problems has now been found by marketing researchers from USDA's Agricultural Marketing Service.

Microorganisms cause the decay by spreading from a few infected peaches to others as they move from the orchard, through the packing process, and through the hydrocoolers. The peaches then decay on the way to the store.

The marketing researchers found, in earlier studies, that such decay could be reduced by adding a fungicide, sodium orthophenyl phenate, to the hydrocooler ice water. But the amount of fungicide is important; too much injures the fruit and too little does not control decay.

To make matters more difficult, the ice melting in the hydrocoolers rapidly dilutes the fungicide. And, chemical tests to determine when more fungicide is needed are impractical under packing shed conditions.

This difficulty was recently overcome when Wilson L. Smith, Jr., and Walter H. Redit, both AMS marketing researchers, found that the concentration of the fungicide in the hydrocooler could be kept practically constant by using ice made with a solution of the fungicide. As the treated ice melts, it releases just the right amount of fungicide to maintain the proper concentration.

The fungicidal residue left on the peaches is within the limits established by the Food and Drug Administration, if the treatment is properly used.

Although this treatment is successful, it has its limits. It gives good protection to peaches with a low or moderate level of infection. But if the initial infection is heavy, the results will be less satisfactory. Good decay-control practices in the orchard are therefore still very important.

For an alternative treatment to reduce decay, see "Dipping Peaches in Hot Water Reduces Postharvest Decay" in the February 1962 issue of *Agricultural Marketing.*

Growth Through Agricultural Progress

FRESH LAMB

NEW or improved cooling systems for farm products in marketing channels are under continuing development. Researchers in the USDA's Agricultural Marketing Service have recently tested four of the newer developments, with good results.

Each of the four systems tested kept fresh lamb in good condition throughout a 4-day trip from Colorado to Philadelphia, Pa. Shipments were made in two rail cars and two truck trailers, which were carried piggyback.

One of the rail cars was equipped with a mechanical refrigerator. The car's air circulation system channeled cold air through flues along the sides, bottom, and top of the car, with openings along the top to permit the air to flow down over the meat.

The second rail car was a rebuilt conventional ice-cooled car. More cargo space was obtained by removal of one of the ice bunkers; the other bunker was enlarged to hold 8,200 pounds of crushed ice. A diesel motor was installed beneath the car to power a generator supplying current for four fans and the necessary control equipment.

Three of the fans were regulated by a thermostat, and circulated air through the ice bunker and the cargo space. The fourth fan circulated air only in the cargo space, but operated continuously, whether the car was moving or not.

Both trailers had identical refrigeration units, but contained different air circulation systems. Air was blown from the cooling coil over the top of the meat, in one trailer. Four plastic ducts were installed in the other trailer, so that cold air was directed into the cargo space ⅓ from the front, and also ⅔ from the front of the trailer.

Test cars and trailers were precooled before loading. In all cases the thermostats were set at 35° F., and the freshly killed lamb was chilled 24 hours before loading.

Although temperature regulation was adequate, some modifications of the air circulation patterns may be needed. Direct movement of air over the meat caused slight shrinkage—about ½ to 1¼ percent—in some instances, in the tests. Although circulation of air was occasionally uneven throughout the cars and trailers, there was no difficulty with sliming, a sign of too little circulation.

More complete details appear in Marketing Research Report No. 553 titled, "Fresh Lamb Transported by Refrigerated Rail Cars and 'Piggyback' Trailers." Research in this study was conducted by Harold D. Johnson, Joseph J. Dougherty, Jr., and Ronald W. Penney, Transportation and Facilities Research Division, and by Roman Kulwich, Market Quality Research Division, Agricultural Marketing Service.